Lesson 2

Historical Development of Public Health Surveillance

Instructor's Guide Form

Lesson Title: Historical development of public health surveillance

Lesson Goal: For each student to understand key developments in the history of public health surveillance.

Learning Objectives: By the end of this lesson, the learner will be able to:

1) identify key incidents in the development of public health surveillance;

2) describe the current state of public health surveillance

Equipment and Materials Needed:

- Overhead projector
- Transparencies #2.1- # 2.7

Time required: 45 minutes

Synopsis of lesson: This lesson provides the historical development of public health surveillance. This will give the learner a foundation for future lessons.

Adult Education Application: After reviewing the history of public health surveillance, try to engage the students in an interactive discussion by asking open-ended questions that apply historical information to contemporary issues. A question could be: What do you think are the major lessons we have learned from the development of public health surveillance that have particular relevance for today's issues? Another question might be: If the future is an extension of the past, what do you think the future issues facing public health surveillance are? You can either record their responses on overhead slides or merely engage the class in an interactive discussion.

Lesson 2

Historical Development of Public Health Surveillance

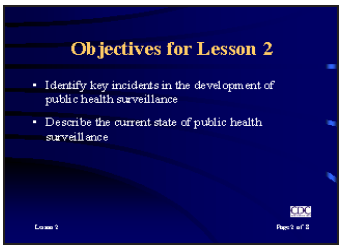
Topical Outline

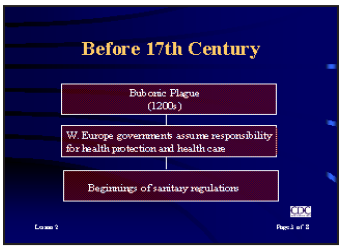
I. History of surveillance before and during the Middle Ages
- A. Hypocrites
- B. Bubonic plague
- C. Evolution of current concepts of public health surveillance

II. History of surveillance in the 17th and 18th centuries
- A. Events which enabled a large-scale organized system of surveillance
- B. Roots of analysis of surveillance data
- C. Development of concepts of public health surveillance

III. History of surveillance in the 19th century
- A. Events regarding surveillance data
- B. Events in public health surveillance activities
- C. Events in reporting

IV. Development of surveillance in the 20th century
- A. Events in reporting
- B. Events in dissemination of statistics
- C. Authority to require notification of diseases





Lesson 2

Historical Development of Public Health Surveillance

Content Outline

Lesson Objectives:

- **Identify key incidents in the development of public health surveillance**
- **Describe the current state of public health surveillance**

I. History of surveillance before and during the Middle Ages

A. Hypocrites' ideas laid foundation for surveillance

1. idea of observing and recording facts
2. analyzing data
3. considering reasonable courses of action

B. Bubonic plague

1. first real public health action resulting from surveillance
2. public health authorities boarded ships in the port near Republic of Venice to prevent persons with plague-like illness from disembarking

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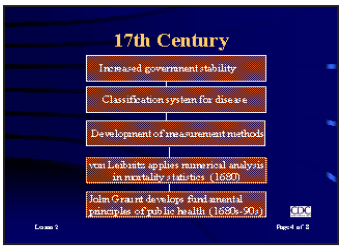

C. Evolution of current concepts of public health surveillance

1. evolved from public health activities to control and prevent disease in the community

2. in late middle ages, governments in western Europe assumed responsibilities for both health protection and health care of the population of their towns and cities
3. rudimentary system of monitoring illness led to regulations against polluting streets and public water, instructions for burial and food handling, and the provision of some types of health care

II. History of surveillance in the 17th and 18th centuries

A. Events came together in 17th century to enable a large-scale, organized system of surveillance to be developed

1. some semblance of an organized health care system in a stable government (first occurred around time of Roman empire)

2. classification system for disease and illness had to be established and accepted
    a. developed in 17th century
    b. work of Sydenham

3. adequate measurement methods developed in 17th century

B. Roots of analysis of surveillance data

1. von Leibnitz (1680s)
    a. called for the establishment of a health council

    b. the application of a numerical analysis in mortality statistics to health planning

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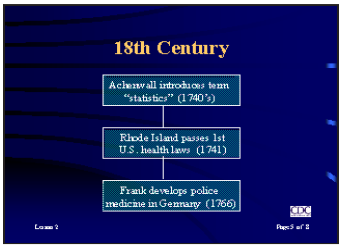
2. John Graunt (late 17th century)
    a. published Natural and Political Observations Made Upon the Bills of Mortality

    b. attempted to define the basic laws of natality and mortality

    c. developed some fundamental principles of public health surveillance (disease-specific death counts, death rates, concept of disease patterns)



C. Development of concepts of public health surveillance, 18th Century

1. Achenwall (1740's-50's)
    a. introduced the term statistics
    b. influenced the increasing collection of vital statistics

2. U.S. development (mid 18th century)
    a. focused on infectious diseases
    b. Rhode Island passed an act requiring tavern keepers to report contagious disease among patrons (1741)
    c. Rhode Island passed a broader law requiring the reporting of smallpox, yellow fever, and cholera (1743)

3. Johann Peter Frank (1766)
    a. advocated a more comprehensive form of public health surveillance
    b. developed system of police medicine in Germany
    c. system covered school health, injury prevention, maternal and child health, and public water and sewage
    d. system delineated government measures to protect the public's health

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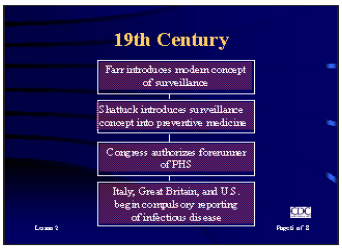

III. History of surveillance in the 19th century

A. Events in development of concept of public health surveillance activities

1. William Farr (1807 - 1883)
    a. one of the founders of modern concepts of surveillance
    b. superintendent of statistical department of Registrar General's office of England and Wales (1839 - 1879)
    c. collected vital statistics
    d. assembled and evaluated data
    e. reported data to health authorities and the public
    f. provided vital statistics data to John Snow for his studies on cholera
2. Thurnam (1845)
    a. published first extensive report of mental health statistics (London)

3. Semmelweis (1833-1840)
    a. collected hospital surveillance data to determine course of puerperal fever; instituted control measures (hand washing); maintained surveillance to prove effectiveness of control measures (Vienna)

4. Lemuel Shattuck
    a. Massachusetts Sanitary Commission produced a landmark publication (1850) that related death, infant and maternal mortality, and communicable diseases to living conditions

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b. recommendations:
    1) decennial census
    2) standardization of nomenclature of causes of disease and death
    3) collection of health data by age, gender, occupation, socioeconomic level, and locality
c. applied concepts to program activities in immunization, school health, smoking, alcohol abuse
d. introduced concepts into teaching of preventive medicine

C. Events in reporting

1. national disease-monitoring
    a. in U.S. began in 1850
    b. mortality statistics based on death registration and the decennial census were first published by the Federal Government for the entire United States

2. systematic reporting of disease in U.S. began in 1874
    a. Massachusetts State Board of Health instituted a voluntary plan for weekly reporting by physicians on prevalent diseases
    b. used a standard postcard reporting format

3. collection of morbidity data
    a. Congress authorized forerunner of Public Health Service to do so in 1878
    b. data were used in quarantine measures against pestilential diseases (cholera, smallpox, plague, yellow fever)

4. compulsory reporting of infectious diseases
    a. Italy - 1881
    b. Great Britain - 1890

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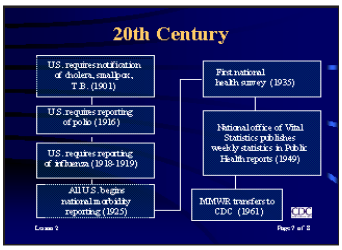
c. Michigan - 1893 - first United States jurisdiction to require reporting of specific infectious diseases
d. United States - 1893 - law requiring collection of information each week from state and municipal authorities throughout the United States



IV. Development of surveillance in the 20th century in United States

A. Events in reporting

1. required notification of selected communicable diseases (1901)
    a. required reporting to local authorities
    b. such as cholera, smallpox, tuberculosis

2. Public Health Service (PHS) personnel appointed as collaborating epidemiologists to serve in state health departments to telegraph weekly disease reports to PHS (1914)

3. all states began participating in national morbidity reporting (1925)
    a. followed worldwide poliomyelitis epidemic (1916)
    b. influenza pandemic (1918 - 1919)

4. first National Health Survey of U.S. citizens (1935)

5. National Office of Vital Statistics assumed responsibility for morbidity reporting
    a. due to 1948 PHS study
    b. led to revision of morbidity reporting procedures

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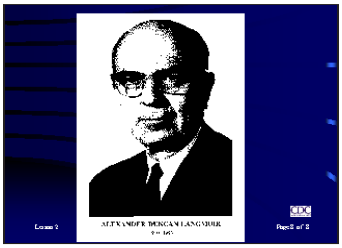

B. Events in dissemination of statistics

1. National Office of Vital Statistics began publishing weekly statistics that had been in Public Health Reports (1949)

2. added mortality data to their publication (1952) and called Morbidity and Mortality Weekly Report (MMWR)

3. this function transferred to Communicable Disease Center (now, Centers for Disease Control and Prevention) (1961).

4. MMWR concept further developed by Alexander Langmuir

5. continued evolution of MMWR and public health surveillance directed by events
    a. poliomyelitis-following Cutter incident
    b. influenza
    c. salmonella-following epidemics of 1961-62
    d. injuries

C. Authority to require notification of diseases

1. resides in respective state legislatures in a variety of ways
    a. authority may be enumerated in statutory provisions or
    b. authority may be given to state boards of health
    c. reports may be required under both statues and health department regulations

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2. Other areas where variation exists among states
    a. what conditions and diseases are reported
    b. time frames for reporting
    c. agencies to receive reports
    d. persons required to report
    e. conditions under which reports are required
    f. amount of information reported

3. Council of State and Territorial Epidemiologists (CSTE)
    a. authorized in 1951 by parent body, the Association of State and Territorial Health Officials (ASTHO)
    b. meets annually
    c. CSTE, in collaboration with CDC, recommends changes in morbidity reporting and surveillance, including what diseases should be reported to CDC and published in MMWR or other CDC publications
    d. develops reporting procedures

D. Role of the Centers for Disease Control and Prevention

1. Support the states
    a. collect, collate, analyze, and report data
    b. prepare and distribute regular comprehensive reports
    c. prepare, and distribute special reports as data are available
    d. provide computer services
    e. provide training in all aspects of public health surveillance

2. Suggest changes to be considered in public health surveillance activities

3. Report to the World Health Organization (WHO) as required and appropriate

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